Part 1 – Railway Course

The railway was an essential tool of the industrial revolution that began at the beginning of the 19th century. This unpublished document is a direct testament to this.
Transcribed from the original manuscript of an ***engineer and professor*** who worked for many years both within the Royal School of Bridges and Roads and in the field, ***helping to develop the French railway network***, this notebook offers a unique insight into the birth of a mode of transport that would transform the country.

Initially presented as:

> "Lessons given at the School of Bridges and Roads, aimed at describing the works carried out on the Paris-Orléans railway, and some general considerations on railways,"

these lessons are enriched by ***notes taken by students***, delving deeper into numerous complementary points: routes, costs, rails, earthworks, civil engineering structures... It is not a popularisation work, but rather a ***set of practical courses*** on the ins and outs of the techniques to be implemented — both physically, economically and legally — to build these structures.
Enriched with ***15 technical plates***, this course is accessible to everyone and has significant historical value. It explains, among other things, why a tunnel must be at least eight metres high, and allows us to understand the presence of such architectural elements near the Parisian stations. This is just a very brief overview of the technical discoveries offered to us.
Some equations are present. If they put you off, ***it is not necessary to read them***: the text provides many concrete elements, sufficient for a "technico-historical" understanding of the works.
Note on numbering: There is no fourth lesson. I think the title above "Description of the works of the Paris-Orléans railway" (page 23 of this document, page 16 of the original) is simply missing. I preferred to keep the original content rather than to speculate.
High-resolution scans of the plates are available in a separate .zip file from the pages file.

Part 2 – Applied Mechanics

Second part of this collection, these "Notes on Applied Mechanics" — delivered as part of lecture courses at the Royal School of Bridges and Roads in 1842-1843 — bear the mark of the same ***engineer and professor***, whose field experience (railway networks, seaports) here nourishes the teaching of fundamental principles.

This course requires a ***good level of mathematics*** to be fully grasped.
However, the neophyte can find, thanks to the plates, a certain number of elements on the implementation of pulleys, ropes, etc.

The ***future engineer*** will find there the very bases of applied mechanics: timeless principles, described in clear language and accompanied by all the necessary and sufficient graphic representations for their perfect understanding.

Warning: Initially, transcription errors had crept into some equations. During the translation provided by AI for the Russian and English versions of these courses, I was treated to masterful demonstrations on some of them, pointing out errors. Thus, I was able to correct some incorrect entries, but in other cases, referring to the manuscript, the edited text perfectly matched the original.
It should be noted that I sometimes received demonstrations starting from a suspicion of error and ending with an "OK". In other cases, a remark was made: "unclear". In two specific cases, a demonstration indicated an error, but was inconsistent with the basic variable declarations and/or the reference equations previously established.
Nevertheless, the author may have made mistakes, which were corrected during the lessons, but which remain in the manuscript.

This is why the French .odt document has, in its comments, the ***page number of the original manuscript*** (scans are available in .zip), allowing reference to it.

Part 3 – Port Construction

The last course in this collection, "Port Construction" was taught by the same ***engineer and professor***, whose action in the field — ***the development of seaports*** — gives this teaching a concrete and practical dimension.
We are here at the ***turning point of the technical evolution of the navy***. From the sailing navy, which still predominated at that time, the steamship navy gradually emerged. The author addresses this evolution, preparing future engineers for this change, but the sailing navy also holds a significant place, revealing a number of essential points that the engineer will have to respect for the creation of ships.

Starting from the necessities of ***building slips and dry docks***, all the technical constraints relating to their development are described, as well as — using examples — the means employed to solve problems of watertightness, access, etc.
The development of ***seaports***, as well as the constraints linked to siltation, currents, the necessary surfaces for mooring vessels, and protection against storms, also occupies a predominant place. Although everything is linked, the author manages to provide all the elements for these creations without any repetition and in clear language.
A primordial element of the navy of that era: ***ropes***. Even if synthetic materials are now used, manufacturing methods remain the same today, with the same technical constraints...

Small curiosity: At the end of the work, mention is made of the construction of ***Fort Boyard***, unfinished at the time, and the problems encountered in creating its foundations.
In short, a technico-historical document, accompanied by 20 plates, whose reading is truly accessible to everyone.
However, specific terms related to the maritime field are not necessarily understandable. This is why I have added, at the end of the document, a ***glossary*** containing a number of terms with their definitions from various sources.

Appendices to Port Construction

This ***marine glossary*** is available at the end of the Port Construction document, but some may find it interesting to have it in a separate form.
It contains a number of specific terms with their definitions from very varied sources.

Door-boats are very specific systems for closing locks or basins.
It is difficult to grasp their structures, as their name suggests a vessel beached on demand; but this is not the case at all.
This document, originating from the School of Bridges and Roads, provides their technological description as well as their implementations.

To learn more about the genesis of these documents and their family transmission, please refer to the Readme_en.pdf file.